

I CLAIM:

1. A system for controlling inlet shock position and airflow Mach number in an engine of a hypersonic vehicle, comprising:

(a) an air inlet for directing airflow into the engine of a hypersonic vehicle, said inlet defined by a ramp angle and shock on lip angle selected for a first airflow Mach number through said inlet; and

(b) means disposed near the inlet airflow for exchanging thermal energy with at least a portion of the airflow through said inlet, for one of increasing or decreasing the Mach number of the airflow into the engine.

2. The system of claim 1 wherein said ramp angle is about 6° , and said shock on lip angle is about 12.67° .

3. The system of claim 1 wherein said means for exchanging thermal energy with at least a portion of the airflow through said inlet is warmer than the airflow into said inlet for airflow into the engine at a second Mach number larger than said first Mach number, and wherein said means for exchanging thermal energy with at least a portion of the airflow through said inlet is cooler than the airflow into said inlet for airflow into the engine at a third Mach number smaller than said first Mach number.

4. The system of claim 1 wherein said means for exchanging thermal energy with at least a portion of the airflow through said inlet includes means for injecting a spray of hot fuel into the airflow through said inlet.

5. In an air inlet structure for the engine of a hypersonic vehicle, the inlet defined by a preselected ramp angle and shock on lip angle, an improvement comprising means disposed near the inlet airflow for exchanging thermal energy with at least a portion of the airflow through said inlet, for one of increasing or decreasing the Mach number of the airflow into the engine.

6. The system of claim 5 wherein said means for exchanging thermal energy with at least a portion of the airflow through said inlet includes means for injecting a spray of hot fuel into the airflow through said inlet.

7. A system for controlling inlet shock position and airflow Mach number in an engine of a hypersonic vehicle, comprising:

(a) an air inlet for directing airflow into the engine of a hypersonic vehicle, said inlet defined by a ramp angle and shock on lip angle selected for a first airflow Mach number through said inlet;

(b) duct means operatively interconnecting said inlet and the combustor region of the engine for conducting heated fuel from the combustor region of said engine to said inlet; and

(c) means for injecting a spray of said hot fuel into the airflow through said inlet.

8. The system of claim 7 further comprising means disposed along said duct means for selectively cooling said hot fuel prior to injection into the airflow through said inlet.

9. The system of claim 7 wherein said means for injecting a spray of said hot fuel into the airflow through said inlet comprises an array of spray nozzles or atomizers.

10. The system of claim 7 wherein said ramp angle is about 6° , and said shock on lip angle is about 12.67° .